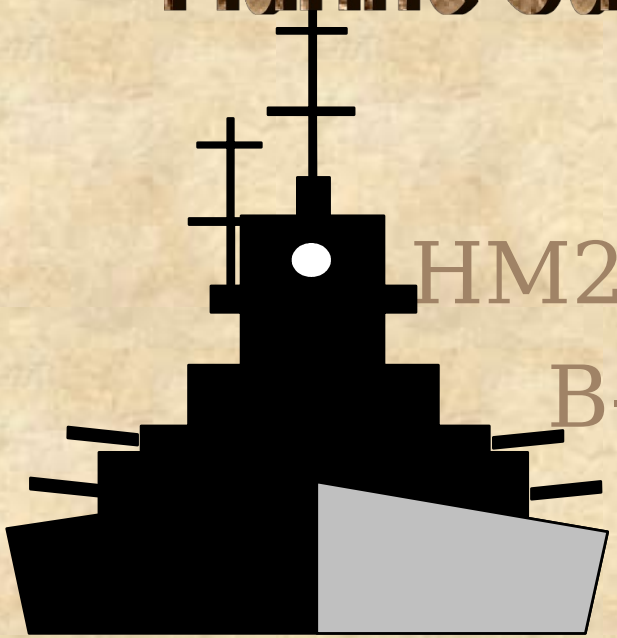
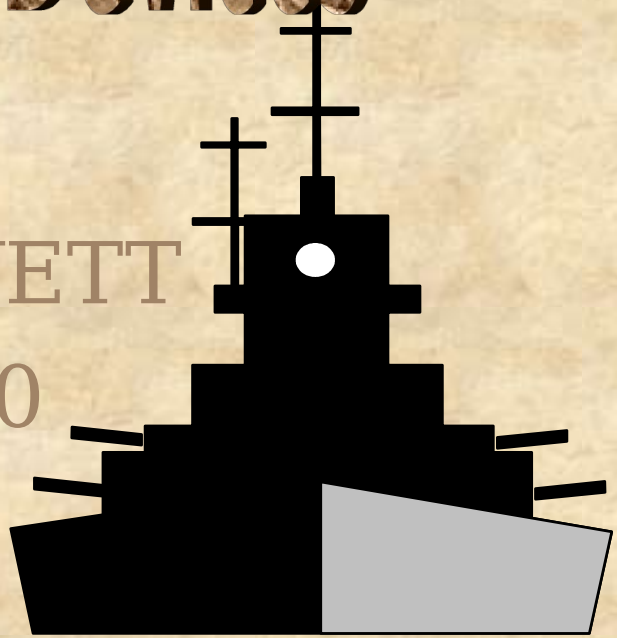
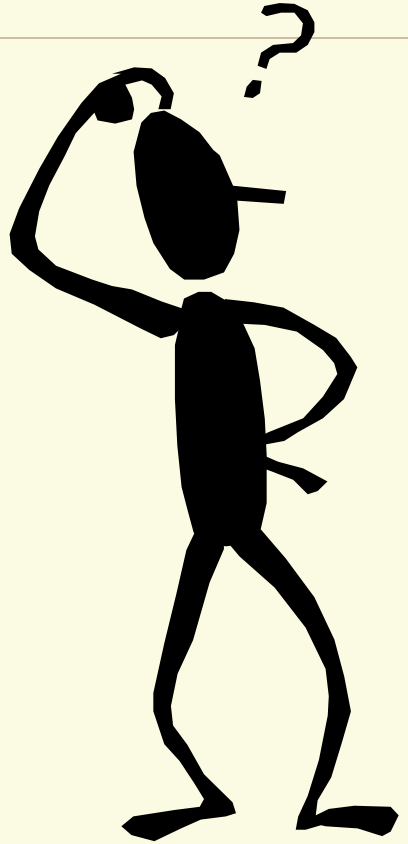
Health Aspects of Marine Sanitation Devices





HM2 (FMF) YETT

B-322-2130



USMC

Navy Policy on Shipboard Sewage Disposal (Why we care, officially)

Navy ships shall be equipped with Marine Sanitation Devices (MSDs) designed to prevent the discharge of untreated or inadequately treated sewage, or any waste derived from sewage (i.e., sludge), within 0-3 nm of the U.S.

Reference: OPNAVINST 5090.1B art 19.3.4

MSD Accident in Yorktown, VA (the practical reason)

4 civilians killed in Yorktown mishap

YORKTOWN, Va. — Four civilian employees working at Yorktown Naval Weapons Station were killed in a sewage tank accident Sept. 12, base officials said.

The accident occurred when one of the workers entered a sewage tank on the station's pier on the York River to do some maintenance, said Kay Phillips, public information officer at Naval Ordnance Center, Atlantic Division.

He apparently was overcome by fumes while disconnecting a valve in the tank. With the valve disconnected, the tank partially filled with gas and sewage, she said.

Phillips said the other three workers entered the tank, apparently to rescue their colleague, and were overcome by fumes. Methane, an odorless, colorless and combustible gas, is often found in sewage tanks.

J. Thomas Black, a base spokesman, identified the dead as Randy Sparks and Orlando Welsh, both of the Lackey community in James City County; Jason Parker of Seaford; and Darrell Gauthier of Norfolk. The four worked for Virginia Beach-based Qualicon Corp.

— Compiled from staff and wire reports

Source: Navy Times
September 23, 1996

Enabling Objectives

Introduction to Marine Sanitation Devices

- 1.1 Identify MSD references.
- 1.2 Identify MSD-related health/safety command responsibilities.
- 1.3 Define MSD terms.
- 1.4 Identify types of MSDs in use today.

References: Introduction to Marine Sanitation Devices

- NAVMED P-5010 Ch. 7, “Wastewater Treatment and Disposal Ashore and Afloat”
- NSTM Ch. 593, section 4, “SEWAGE”
- (GENSPECS), section 593a, “Sewage and Wastewater, Pollution control systems”

References: Introduction to Marine Sanitation Devices

- OPNAVINST 5100.19C, “Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat” ch. C15, “Marine Sanitation Devices”
- OPNAVINST 5090.1B “Environmental Protection and Natural Resources Manual”

Commanding Officer's MSD Responsibilities

- Ensure the ship or ship's system is:
  - Properly operated.
  - Periodically inspected.
  - Properly maintained.
  - In compliance with applicable federal and state regulations.

Commanding Officer's MSD Responsibilities

- Ensure that the ship's MSD workers:
  - Are properly trained
  - Are fully aware of associated documentation, particularly that concerning health and sanitation procedures.
- Ensure MDRs conduct inspections to maintain sanitary and hygienic conditions of MSD systems and operational practices.

Commanding Officer's MSD Responsibilities

- Ensure appropriate health and sanitation precautions are posted.
- Report to fleet commanders any conditions or system/equipment malfunctions which would require sewage discharge into U.S. navigable waters.

Gas Free Engineer's Responsibilities

- Ensure sufficient personnel are trained and qualified to meet the requirements of the command.
- Ensure all equipment to conduct GFE is aboard the ship.

Gas Free Engineer's Responsibilities

- Ensure gas free certificates are posted as necessary in necessary areas.
- Determine the need for additional temporary ventilation for spill or leak clean-ups.

MDR Responsibilities

- Conduct inspections
- Indoctrinate MSD workers
- Provide on-site advice for major sewage leaks or spills.
- Mark MSD-worker's health records and ensure that they have received required immunizations.

Terms

- Marine Sanitation Device
- Wastewater
- Waste Drains
- Grey Water
- Soil Drains
- Black Water/Sewage
- Septic Sewage
- Influent
- Effluent
- Aerosol
- Drip pans
- Coaming
- Contiguous Zone
- Territorial Seas
- Navigable Waters
- Restricted Zone

Collect Hold and Transfer (CHT) Systems

- Three operational modes
  - *Restricted Waters* - sewage is collected from soil drains and held in storage tanks.
  - *At sea* - all wastewater is diverted overboard.
  - *In port* - Wastewater is discharged into a sanitary sewer or a Sewage Waste Offloading Barge (SWOB).

Collect Hold and Transfer (CHT) Systems

- Installed on the majority of USN ships
- Two types in use based on tank capacity
  - Tank capacity 2000 gal or greater
    - Equipped with comminuters
    - Makes waste into a slurry
    - Tanks are equipped with level sensors and an aerator.
  - Tank capacity less than 2000 gal.
    - Equipped with a strainer, high level alarm, and a wash-down system.

General American Transportation Corporation (GATX) Evaporative Toilet System

- Found on PHMs, MSOs and MCMs
- 2 Modes of Operation:
  - Restricted waters - Wastewater is evaporated in the evaporation tank. Must be emptied at least twice a month.
  - Unrestricted waters - Waste is dumped directly overboard.

GATX MK II JERED VACU-BURN

- Designed for DD 963 and CG 47 class ships.
- Waste is incinerated to a sterile ash.
- Three Modes of Operation
  - Unrestricted waters - Sewage is dumped over the side
  - Restricted waters - Sewage is incinerated.
  - Pier discharge

GATX MK II JERED VACU-BURN

- Advantage:
  - Because vacuum pumps maintain the collection tank (VCHT) at a partial vacuum any leakage from piping is likely to be inward.

Enabling Objectives

Introduction to Marine Sanitation Devices

- 1.1 Define MSDs terms.
- 1.2 Identify MSDs references.
- 1.3 Identify types of MSDs in use today.
- 1.4 Identify MSD-related health/safety

command responsibilities.

Question

- The reference which outlines medical department responsibilities regarding MSDs is:
  - A. GENSPECS, Section 593a, Sewage & waste water pollution control systems
  - B. NAVOSH, Navy Occupational Safety & Health Program Manual for Forces Afloat
  - C. NAVMED P-5010 CH 7, Wastewater treatment & disposal ashore & afloat
  - D. NSTM CH 593, Section 4, Sewage
  - E. All of the above

Answer

- C. NAVMED P- 5010, CH 7 Wastewater treatment & disposal ashore & afloat

Question

- NSTM CH 505, Piping contains:
  - A. Required color coding of system components
  - B. Hose hookup & disconnect procedures
  - C. Criteria & standards for piping
  - D. Description of different MSD systems, components, & terminology associated with MSD systems
  - E. Both A & C

Answer

- ✔ E. Both A & C

Question

- All hands are responsible for:
  - A. Proper personal hygiene
  - B. Securing the MSD spill from traffic
  - C. Evacuating the space where the spill occurred
  - D. Immediately notifying the XO, DCA, & MDR
  - E. All of the above

Answer

- ✔ E. All of the above

Question

- Part of the MDR's responsibilities regarding MSDs are to mark the records of MSD personnel & ensure these personnel receive their required immunizations

  A. True

  B. False

Answer

- ✔ A. True

Question

- Black water includes waste from:
  - A. Showers
  - B. Sculleries & sinks
  - C. Laundries
  - D. Commodes & urinals
  - E. All the above

Answer

- ✔ D. Commodes & urinals

Question

- Navigable waters are:
  - A. Bodies of water of the U.S. (0-3 nm from shore)
  - B. The territorial sea & internal waters (rivers & lakes) of the U.S.
  - C. A zone of ocean extending from 3-12 nm from the U.S. coastline
  - D. A zone of the ocean extending from the U.S. coastline out to 3 nm from shore
  - E. All of the above

Answer

- ✔ B. The territorial sea & internal waters (rivers & lakes) of the U.S.

Question

- Which is true about the Pall Trinity System?
  - A. It is a zero discharge, controlled volume flush
  - B. It is a zero discharge, full volume flush
  - C. It is a system designed for collecting & holding sewage from urinals & toilets until it can be properly discharged
  - D. Uses aerobic bacteria to digest & break down organic matter & render wastewater acceptable for discharge into restricted waters
  - E. None of the above

Answer

- D. Uses aerobic bacteria to digest & break down organic matter & render wastewater acceptable for discharge into restricted waters

Question

- The GATX Evaporative toilet is an example of:
  - A. Flow through treatment system
  - B. Zero discharge, controlled volume flush
  - C. Zero discharge full volume flush
  - D. A type of MSD installed onboard amphibious assault ships

Answer

- B. Zero discharge, controlled volume flush